



# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
-----------------	-------------	----------------------	---------------------	------------------

09/866,051

05/25/2001

Aindra O'Callaghan

AP103TP

4170

20178

7590

03/23/2004

EPSON RESEARCH AND DEVELOPMENT INC  
INTELLECTUAL PROPERTY DEPT  
150 RIVER OAKS PARKWAY, SUITE 225  
SAN JOSE, CA 95134

EXAMINER

EDWARDS, PATRICK L

ART UNIT

PAPER NUMBER

2621

DATE MAILED: 03/23/2004

5

Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

Application No.

09/866,051

Applicant(s)

O'CALLAGHAN ET AL.

Examiner

Patrick L Edwards

Art Unit

2621

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☐ Responsive to communication(s) filed on \_\_\_\_.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-50 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-50 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date 3.
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_.

Art Unit: 2621

## DETAILED ACTION

### *Claim Rejections - 35 USC § 112*

1. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

2. Claims 1-4 and 33-36 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

With regard to claims 1 and 33, the term "area" in parts (b)(3) and (b)(5) of the respective claims lacks antecedent basis.

Claims 2-4 and 34-36 are rejected because of their dependency on indefinite claims.

### *Claim Rejections - 35 USC § 103*

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 1-8, 17-22, 31-40 and 49-50 are rejected under 35 U.S.C. 103(a) as being unpatentable over Breish (USPN 5,845,018) in view of Aikawa et al (USPN 6,317,221), and further in view of Pasco et al (USPN 6,064,778).

With regard to claim 1, Breish discloses scanning a medium at a relatively low resolution to generate a low resolution digital representation of the medium and the individual images thereon (Breish col. 2 lines 52-62). The block of image data disclosed in Breish is analogous to a low resolution digital representation of the medium as recited in the claim. Breish further discloses defining borders of the medium such that all of the individual images are within the defined borders (Breish col. 2 lines 58-61). Breish further discloses detecting edges of each area containing at least one image (Breish col. 2 lines 59-61), and locating each of the individual images within its corresponding area in the medium (Breish col. 2 lines 59-61). Breish further discloses generating an index of all

Art Unit: 2621

individual images identified on the medium (Breish col. 3 lines 1-2). The display of all scanned images from the first medium as disclosed in Breish is analogous to an index of the individual images as recited in the claim.

Breish fails to expressly disclose applying a smoothing filter to the low resolution representation. Aikawa, however, teaches applying such a filter in a similar environment (Aikawa col. 22 lines 35-42). It would have been obvious to one reasonably skilled in the art at the time of the invention to modify Breish's method for extracting individual images by applying a smoothing filter to the image as taught by Aikawa. Such a modification would have allowed for the removal of noise (such as film grain) in the image (Aikawa col. 22 lines 35-42).

The combination of Breish and Aikawa discloses all of the limitations of claim 1, but fails to expressly disclose determining, and if necessary correcting, the orientation of the medium. Pasco, however, teaches correcting the orientation of a scanned image (Pasco col. 3 line 66 – col. 4 line 15). It would have been obvious to one reasonably skilled in the art at the time of the invention to modify the combination of Breish and Aikawa's image extraction method in order to compensate for a skewing of the image which is scanned as taught by Pasco. Such a modification would have allowed for a method which compensated for an incorrect orientation of an image during the scanning process (Pasco col. 4 lines 6-10).

With regard to claim 2, Aikawa further discloses selecting one or more of the individual images from the index, rescanning each of the selected individual images at a relatively high resolution and generating a high-resolution output of each of the selected individual images (Aikawa col. 16 lines 32-54). The selection of the thumbnail image as disclosed in Aikawa is analogous to selecting an individual image from the index as recited in the claim. The scanning of this image as disclosed in Aikawa is analogous to re-scanning the image at a relatively high resolution as recited in the claim. It would have been obvious to one reasonably skilled in the art at the time of the invention to combine the re-scanning of an image selected from an index at a higher resolution as taught by Aikawa with Breish's image extraction method in order to have a method which only scanned selected images at a high resolution. Such a modification would have made for a more efficient image extraction method in that all of the images weren't scanned, but only the selected images.

With regard to claim 3, Breish further discloses reading images from a microfiche (Breish col. 4 line 1). The microfiche disclosed in Breish qualifies as a slide as recited in the claim.

Art Unit: 2621

With regard to claim 4, Breish further discloses an index which is a collection of thumbnail images (Breish col. 8 lines 38-40).

With regard to claims 33-36, a computer-readable recording medium that stores a program which causes the computer to execute the steps of a method is essential if the image processing method disclosed in the combination of Breish, Aikawa and Pasco is to function. Therefore, a computer-readable recording medium is inherent in the teachings of Breish, Aikawa and Pasco.

With regard to claim 19, which is representative of claim 5, Breish discloses a scanner for scanning the medium and the holder at a relatively low resolution to generate a low-resolution digital representation of the holder and the medium including the individual images thereon (Breish col. 2 lines 52-62). Breish discloses that the images which are scanned are contained on a microfiche, which is analogous to an image holder as recited in the claim in that it holds a medium in which comprises individual images. As a result, the block of image data disclosed in Breish is analogous to a low resolution digital representation of the holder and the medium as recited in the claim. Breish further discloses a storage medium in communication with the scanner for storing the low resolution representation (Breish col. 8 lines 46-48). Breish further discloses a processing means in communication with a storage medium for processing a low resolution digital representation (Breish col. 8 lines 46-48).

Breish further discloses means for defining borders of the holder such that all of the image holding areas and all of the individual images contained therein are within the defined borders (Breish col. 2 lines 58-61). Breish further discloses means for detecting edge segments of the image holding areas and locating each of the individual images within the image holding areas (Breish col. 2 lines 59-61). Breish further discloses means for generating an index of the individual images identified on the medium (Breish col. 3 lines 1-2). The display of all scanned images from the first medium as disclosed in Breish is analogous to an index of the individual images as recited in the claim.

Breish fails to expressly disclose a means for applying a smoothing filter to the low resolution representation and a means for determining the orientation of at least one image holding area with respect to a reference, and if it determined that the at least one image-holding area is skewed with respect to the reference, for correcting the orientation of the at least one image holding area. These elements, however, are taught by Aikawa

Art Unit: 2621

and Pasco, respectively. The arguments as to why it would be obvious to combine these references are given in the above argument with respect to claim 1, and consequently will not be repeated here.

With regard to claims 20-22, which are representative of claims 6-8, the limitations of the claims and motivation arguments are given in the above argument with respect to claims 2-4, and consequently will not be repeated here.

With regard to claims 31 and 32, which are representative of claims 17 and 18, Breish further discloses that the locating means identifies boundaries of the medium in each of the identified image-holding areas and the boundaries of each individual image (Breish col. 2 lines 59-61). Breish discloses defining the boundaries of the individual images. Defining the boundaries of the individual images inherently defines the boundaries of the medium in the image holding areas in that the image holding area in this particular case is holding the individual image.

With regard to claims 37-40 and 49-50, a computer-readable recording medium that stores a program which causes the computer to execute the steps of a method is essential if the image processing method disclosed in the combination of Breish, Aikawa and Pasco is to function. Therefore, a computer-readable recording medium is inherent in these teachings.

5. Claims 14, 15, 16, 28, 29, 30, 46, 47 and 48 are rejected under 35 U.S.C. 103(a) as being unpatentable over the combination of Breish, Aikawa and Pasco as applied to claims 5, 19 and 37 above, and further in view of Melen et al. (USPN 5,867,277). The arguments as to the relevance of Breish, Aikawa and Pasco as applied in paragraph 4 above are incorporated herein.

With regard to claim 28, which is representative of claim 14, Breish discloses distinguishing the edge segments (boundaries) of an image, but fails to expressly disclose a specific method for doing so. Melen, however, discloses a detecting and identifying means in which components from one type of image area are separated from components from another type of image area. Melen further discloses identifying groups of connected components and identifying each of the image holding areas from the size and shape of the corresponding group of connected components (Melen col. 16 line 50 – col. 17 line 55). The connected components disclosed in Melen are analogous

Art Unit: 2621

to the connected edge segments as recited in the claim. It would have been obvious to one reasonably skilled in the art at the time of the invention to modify the boundary detection and identification means disclosed in the combination of Breish, Aikawa and Pasco, by adding that the boundaries are detected by connecting components as taught by Melen. Such a modification would have allowed for a method of distinguishing one part of an image from another.

With regard to claims 29 and 30, which are representative of claims 15 and 16, the combination of Breish, Aikawa and Pasco discloses computing a rotation angle of each of the image holding areas with respect to a reference using a representative line drawing of a the image holding area (Pasco Figure 10). Said combination fails to expressly disclose that a Hough transform is used to determine the rotation angle.

Melen, however, teaches using a hough transform to determine a skew angle (Melen col. 14 lines 50-52). It would have been obvious to one reasonably skilled in the art at the time of the invention to modify the image rotation determination method disclosed in the said combination by specifying that the rotation angle is determined from a hough transform as taught by Melen. Such a modification would have allowed for the use of an effective mechanism of determining the rotation angle of an image which is well known in the art.

With regard to claims 46, 47 and 48, a computer-readable recording medium that stores a program which causes the computer to execute the steps of a method is essential if the image processing method disclosed in the combination of Breish, Aikawa, Pasco and Melen is to function. Therefore, a computer-readable recording medium is inherent in the teachings of said combination.

6. Claims 9, 23 and 41 rejected under 35 U.S.C. 103(a) as being unpatentable over the combination of Breish, Aikawa and Pasco as applied to claim 19 above, and further in view of Pearlstein et al. (USPN 6,148,033). The arguments as to the relevance of the said combination as applied in paragraph 4 above are incorporated herein.

With regard to claim 23, which is representative of claim 9, Breish discloses defining the border of an image holder, but does not expressly disclose darkening the pixels in, or within a predetermined distance from, the outer most row/column of pixels representing the holder.

Art Unit: 2621

Pearlstein, however, discloses framing an image with black borders within a predetermined distance from the outer most row/column of pixels representing the image (Pearlstein col. 7 lines 48-50). It would have been obvious to one reasonably skilled in the art at the time of the invention to modify Breish's border defining means by adding a darkened pixels around the image as taught by Pearlstein. Such a modification would have allowed for a clearer border definition.

With regard to claim 41, a computer-readable recording medium that stores a program which causes the computer to execute the steps of a method is essential if the image processing method disclosed in the combination of Breish, Aikawa, Pasco and Pearlstein is to function. Therefore, a computer-readable recording medium is inherent in these teachings.

7. Claims 10, 11, 24, 25, 42 and 43 are rejected under 35 U.S.C. 103(a) as being unpatentable over the combination of Breish, Aikawa and Pasco as applied to claims 5, 19 and 37 above, and further in view of Lee (USPN 5,606,375). The arguments as to the relevance of the said combination as applied in paragraph 4 above are incorporated herein.

With regard to claim 24, which is representative of claim 10, Aikawa discloses applying a smoothing filter to a low resolution, RGB representation of an image, but fails to expressly disclose a smoothing filter which only smooths the R data. Lee, however, discloses a low-pass filter (smoothing filter) which operates only on the red channel (Lee col. 6 lines 13-15). It would have been obvious to one reasonably skilled in the art at the time of the invention to modify Aikawa's RGB smoothing filter by including a smoothing filter operable only to filter the red data channel as taught by Lee. Such a modification would have provided a system in which the red channel of an RGB image was separately smoothed.

With regard to claim 25, which is representative of claim 11, Aikawa further discloses that the output pixels of the smoothing filter are determined by the weighted average of the pre-filtered version of that pixel and each of the pixels in a pre-defined neighborhood (Aikawa col. 22 lines 43-47).

With regard to claims 42 and 43, a computer-readable recording medium that stores a program which causes the computer to execute the steps of a method is essential if the image processing method disclosed in the



Art Unit: 2621

combination of Breish, Aikawa, Pasco and Lee is to function. Therefore, a computer-readable recording medium is inherent in these teachings.

8. Claims 12, 26 and 44 are rejected under 35 U.S.C. 103(a) as being unpatentable over the combination of Breish, Aikawa and Pasco as applied to claims 5, 19 and 37 above, and further in view of Yabe et al (USPN 5,337,164). The arguments as to the relevance of Breish, Aikawa and Pasco as applied in paragraph 4 above are incorporated herein.

With regard to claim 26, which is representative of claim 12, Breish discloses detecting edge segments in a low-resolution image, but fails to expressly disclose that the edge segment detection means reduces the image to binary data and then reduces the binary data to the boundaries of the image. Yabe, however, discloses a pixel discrimination method which reduces an image to binary data (Yabe col. 12 lines 1-4). The pixel discrimination means disclosed in Yabe discriminates between an image portion and a non-image portion. This type of discrimination is analogous to edge detection as recited in the claim and it follows that pixel discrimination as disclosed in Yabe is analogous to edge segment detection as recited in the claim. Yabe further discloses reducing the binary data to the boundaries of the image (Yabe col. 16 lines 6-36). Yabe discloses only storing the image regions and not the non-image regions. This is analogous to the reducing the binary data to boundaries of the image holding areas as recited in the claim in that the image regions of Yabe are contained within boundaries. It would have been obvious to one reasonably skilled in the art at the time of the invention to modify Breish's edge (boundary) detection means by reducing the data to only the binary data of the image region as taught by Yabe. Such a modification would have allowed for a more efficient system in which only the necessary data was kept.

9. Claims 13, 27 and 45 are rejected under 35 U.S.C. 103(a) as being unpatentable over the combination of Breish, Aikawa and Pasco as applied to claims 5, 19 and 37 above, and further in view of Mackinnon et al (USPN 6,148,155). The arguments as to the relevance of Breish, Aikawa and Pasco as applied in paragraph 4 above are incorporated herein.

Art Unit: 2621

With regard to claim 27, which is representative of claim 13, Breish discloses an edge determining unit for detecting the boundary (edge) of a low resolution representation of an image. Breish fails to expressly disclose an edge determining unit which is a pre-defined edge-detecting-filter kernel that applies a threshold test to the output pixel of the filter which makes the output pixel either 0 or 1 depending on the result of the threshold test.

Mackinnon, however, discloses an edge detecting filter kernel (Mackinnon col. 10 lines 25-36) and a threshold test which is applied to the output of the filter (Mackinnon col. 10 lines 36-47). Mackinnon further discloses making the output pixel a value of either 0 or 1 depending on the result of the threshold test (Mackinnon col. 10 lines 36-60). It would have been obvious to one reasonably skilled in the art at the time of the invention to modify Breish's generic edge determining unit by specifying that the edge determining unit employ the above method, which is taught by Mackinnon. Such a modification would have allowed for the use of an edge determining method which is well known in the art.

With regard to claim 45, a computer-readable recording medium that stores a program which causes the computer to execute the steps of a method is essential if the image processing method disclosed in the combination of Breish, Aikawa, Pasco and Mackinnon is to function. Therefore, a computer-readable recording medium is inherent in these teachings.

### ***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Patrick L Edwards whose telephone number is (703) 305-6301. The examiner can normally be reached on 8:30am - 5:00pm M-F.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Leo Boudreau can be reached on (703) 305-4706. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

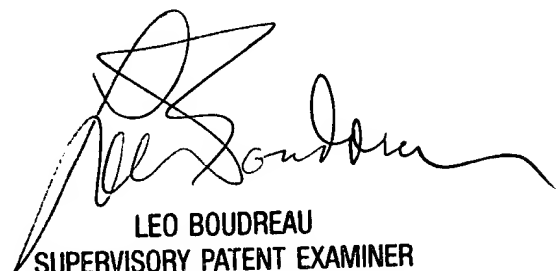
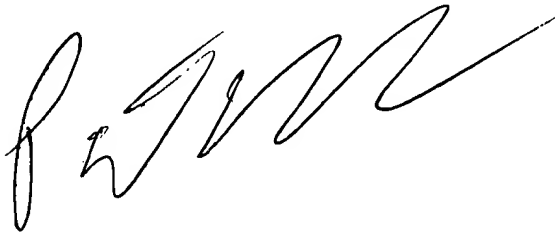
Art Unit: 2621

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Patrick Lynn Edwards

Art Unit 2621

ple



LEO BOUDREAU  
SUPERVISORY PATENT EXAMINER  
TECHNOLOGY CENTER 2600